SCHMERSAL

EN Operating instructions. . . . . .pages 1 to 4
Original

Content

1. About this document

1.1 Function

This operating instructions manual provides all the information you need for the mounting, set-up and commissioning to ensure the safe operation and disassembly of the safety switchgear. The operating instructions must be available in a legible condition and a complete version in the vicinity of the device.

1.2 Target group: authorised qualified personnel

All operations described in this operating instructions manual must be carried out by trained specialist personnel, authorised by the plant operator only.

Please make sure that you have read and understood these operating instructions and that you know all applicable legislations regarding occupational safety and accident prevention prior to installation and putting the component into operation.

The machine builder must carefully select the harmonised standards to be complied with as well as other technical specifications for the selection, mounting and integration of the components.

1.3 Explanation of the symbols used

Information, hint, note:
This symbol is used for identifying useful additional information.

Caution: Failure to comply with this warning notice could lead to failures or malfunctions.
Warning: Failure to comply with this warning notice could lead to physical injury and/or damage to the machine.

1.4 Appropriate use

The products described in these operating instructions are developed to execute safety-related functions as part of an entire plant or machine. It is the responsibility of the manufacturer of a machine or plant to ensure the correct functionality of the entire machine or plant.

The safety switchgear must be exclusively used in accordance with the versions listed below or for the applications authorised by the manufacturer. Detailed information regarding the range of applications can be found in the chapter "Product description".

1.5 General safety instructions

The user must observe the safety instructions in this operating instructions manual, the country specific installation standards as well as all prevailing safety regulations and accident prevention rules.

Further technical information can be found in the Schmersal catalogues or in the online catalogue on the Internet: products.schmersal.com.

The information contained in this operating instructions manual is provided without liability and is subject to technical modifications.

There are no residual risks, provided that the safety instructions as well as the instructions regarding mounting, commissioning, operation and maintenance are observed.

1.6 Warning about misuse

In case of improper use or manipulation of the safety switchgear, personal hazards or damages to machinery or plant components cannot be excluded. The relevant requirements of the standard EN ISO 14119 must be observed.

x.000 / 03.2021 / vA. - 101154121-EN / J / 2021-03-01 / AE-Nr. 12231

1.7 Exclusion of liability

We shall accept no liability for damages and malfunctions resulting from defective mounting or failure to comply with this operating instructions manual. The manufacturer shall accept no liability for damages resulting from the use of unauthorised spare parts or accessories.

For safety reasons, invasive work on the device as well as arbitrary repairs, conversions and modifications to the device are strictly forbidden, the manufacturer shall accept no liability for damages resulting from such invasive work, arbitrary repairs, conversions and/or modifications to the device.

2. Product description

2.1 Ordering code

This operating instructions manual applies to the following types:

AZ 415-①ZPK-②

No.	Option	Description	
①		**S1**	**S2**
	02/11	2 NC	1 NO / 1 NC
	02/02	2 NC	2 NC
	02/20	2 NC	2 NO
	11/11	1 NO / 1 NC	1 NO / 1 NC
②	1637	Gold-plated contacts	

Only if the information described in this operating instructions manual are realised correctly, the safety function and therefore the compliance with the Machinery Directive is maintained.

2.2 Special versions

For special versions, which are not listed in the order code below 2.1, these specifications apply accordingly, provided that they correspond to the standard version.

2.3 Purpose

Safety switches with separate actuators are suitable for movable safety guards, which need to be closed to ensure the necessary operational security. The safety switches are used for applications, in which the hazardous situation is terminated without delay when the safety guard is opened. When the safety guard is opened, the NC contacts are positively opened and the NO contacts are closed.

Operating principle

By closing the safety guard, switch insert S1 is released and switch insert S2 actuated (differentiated operating principle). When the actuator is fully inserted, the safety guard is not subject to any ejection force.

The safety switchgears are classified according to EN ISO 14119 as type 2 interlocking devices.

The user must evaluate and design the safety chain in accordance with the relevant standards and on the required safety level.

The entire concept of the control system, in which the safety component is integrated, must be validated to the relevant standards.

2.4 Technical data

Standards:	EN 60947-5-1, BG-GS-ET-15
Enclosure:	light-alloy diecast, paint finish
Actuator:	zinc-plated metal / aluminium
Coding level according to EN ISO 14119:	low
Protection class:	IP67 to EN 60529
Contact material:	Silver
Contact types:	Change-over contact with double break, type Zb or 2 NC contacts, with galvanically separated contact bridges
Switching system:	⊖ EN 60947-5-1, slow action, NC contact with positive break
Connection:	screw terminals
Cable section:	0.75 … 1.5 mm² (incl. conductor ferrules)
Cable entry:	2 × M20 x 1.5
Rated impulse withstand voltage U_{imp}:	4 kV
Rated insulation voltage U_i:	250 V
Thermal test current I_{the}:	6 A
Utilisation category:	AC-15 / DC-13
Rated operating current/voltage I_e/U_e:	4 A / 230 VAC 4 A / 24 VDC
Max. fuse rating:	6 A gG D-fuse
Required short-circuit current:	1,000 A
Positive break travel:	3.8 mm
Positive break force:	min. 31 N
Ambient temperature:	−25 °C … +70 °C
Mechanical life:	> 1 million operations
Latching force:	80 … 400 N (adjustable)
Actuating speed:	max. 0.2 m/s
Max. switching frequency:	2,000/h

2.5 Safety classification

Standards:	EN ISO 13849-1
Envisaged structure:	
- Basically:	applicable up to Cat. 1 / PL c
- With 2-channel usage and fault exclusion mechanism*:	applicable up to Cat. 3 / PL d with suitable logic unit
B_{10D} NC contact:	2,000,000
B_{10D} NO contact at 10% ohmic contact load:	1,000,000
Mission time:	20 years

* If a fault exclusion to the 1-channel mechanics is authorised.

$$MTTF_D = \frac{B_{10D}}{0{,}1 \times n_{op}} \qquad n_{op} = \frac{d_{op} \times h_{op} \times 3600\ s/h}{t_{cycle}}$$

(Determined values can vary depending on the application-specific parameters h_{op}, d_{op} and t_{cycle} as well as the load.)

If multiple safety components are wired in series, the Performance Level to EN ISO 13849-1 will be reduced due to the restricted error detection under certain circumstances.

3. Mounting

3.1 General mounting instructions

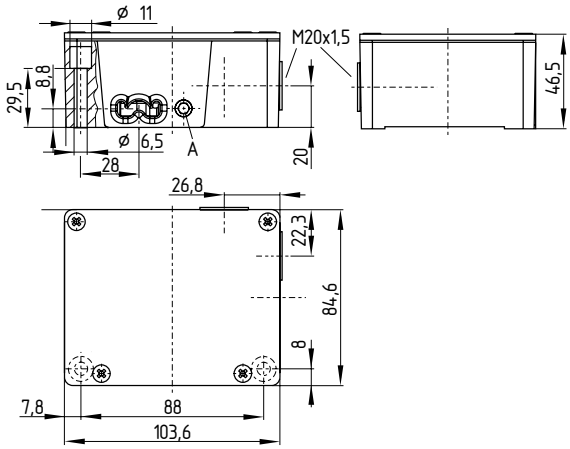
The mounting holes are accessible after removal of the cover. The enclosure must not be used as an end stop. Any mounting position. The mounting position however must be chosen so that the ingress of dirt and soiling in the used opening is avoided.

Mounting of the actuators: See mounting instructions actuators.

Please observe the relevant requirements of the standards EN ISO 12100, EN ISO 14119 and EN ISO 14120.

The actuator must be permanently fitted to the safety guards and protected against displacement by suitable measures (tamperproof screws, gluing, drilling of the screw heads).

3.2 Dimensions
All measurements in mm.



Key
A Setting screw: ball latch 80 ... 400 N

3.3 Adjustment
In the unlocked condition, the safety guard is kept in a closed condition by the adjustable ball latch. By rotating a hexagonal key wrench clockwise, the desired latching force can be increased; if the hexagonal key wrench is rotated anti-clockwise, the latching force is decreased. The latching force must always be set as low as possible.

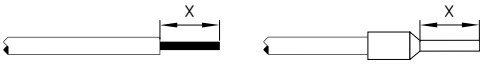
4. Electrical connection

4.1 General information for electrical connection

The electrical connection may only be carried out by authorised personnel in a de-energised condition.

The contact labelling can be found in the wiring compartment of the switch. For the cable entry, suitable cable glands with an appropriate degree of protection must be used. Non-used input openings must be sealed by means of threaded plugs.

Settle length x of the conductor: 6 mm



After wiring, dust and soiling must be removed from the wiring compartment.

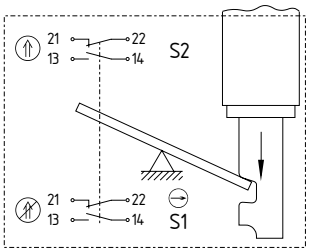
The conductors of the connecting cables must not obstruct the movement of the switching lever.

Maximum tightening torque for the screws:
Cover 0.6 + 0.1 Nm; bottom cover 0.7 + 0.1 Nm

4.2 Contact variants
Contacts are shown with safety guard closed.

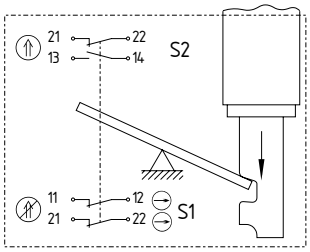
AZ 415-11/11ZPK-M20

S1 1 NO / 1 NC
S2 1 NO / 1 NC



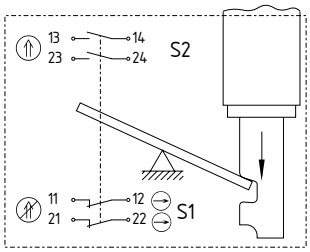
AZ 415-02/11ZPK-M20

S1 2 NC
S2 1 NO / 1 NC



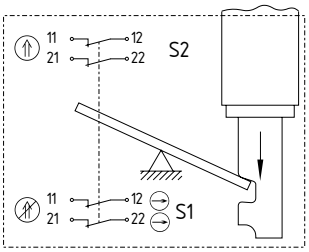
AZ 415-02/20ZPK-M20

S1 2 NC
S2 2 NO



AZ 415-02/02ZPK-M20

S1 2 NC
S2 2 NC



Key
⊖ Positive break
⇑ Actuated
⇗ not actuated

5. Set-up and maintenance

5.1 Functional testing
The safety function of the safety components must be tested.
The following conditions must be previously checked and met:
1. Fitting of the safety switch and the actuator.
2. Check the integrity of the cable entry and connections.
3. Check the switch enclosure for damage.

5.2 Maintenance
A regular visual inspection and functional test, including the following steps, is recommended:
1. Check for correct installation of the actuator and the safety switch.
2. Remove particles of dust and soiling.
3. Check cable entry and connections.

Adequate measures must be taken to ensure protection against tampering either to prevent tampering of the safety guard, for instance by means of replacement actuators.

Damaged or defective components must be replaced.

6. Disassembly and disposal

6.1 Disassembly
The safety switchgear must be disassembled in a de-energised condition only.

6.2 Disposal
The safety switchgear must be disposed of in an appropriate manner in accordance with the national prescriptions and legislations.

7. EU Declaration of conformity

EU Declaration of conformity

SCHMERSAL

Original

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We hereby certify that the hereafter described components both in their basic design and construction conform to the applicable European Directives.

Name of the component: AZ 415

Type: See ordering code

Description of the component: Positive break position switch with separate actuator for safety functions

Relevant Directives:

Machinery Directive	2006/42/EG
RoHS-Directive	2011/65/EU

Applied standards:
EN 60947-5-1:2017
EN ISO 14119:2013

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AZ415-F-EN

The currently valid declaration of conformity can be downloaded from the internet at products.schmersal.com.

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